Journal of Advanced Research in Dynamical and Control Systems, 2018, vol.10, N13 Special Issue, pages 575-580

Biostability of cutting fluid emulsion components

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018, Institute of Advanced Scientific Research, Inc.. All rights reserved. One of the main ways to extend the life of water-soluble coolant-cutting fluids is to increase their biostability, which is determined to the decisive extent by the constituent components. In this paper, they studied the bacteriostability of 14 components of CCF and the ability of micromycetes to use the components of CCF as the sources of nitrogen and carbon. The carried out studies have shown that in order to develop the biostable CCF it is expedient to introduce the following components into their formulation: TEA, trilon B in concentration of 0.10%, cyclohexanol, triethanoamine oleate, and low bacteriostatic resistance of I-12A oil and oleic acid, the main components of emulsion and semisynthetic CCF can be improved by the addition of 2-mercaptobenzthiazole. The following components can be used as the source of carbon nutrition for micromycetes: oleic acid, I-12A oil, studied alcohols and emulsifiers, and Khostakor DT, emulsol, triethanolamine oleate along with mono-and triethanolamine as a nitrogen feed. However, the introduction of cyclohexanol, oleate triethanolamine, triethanolamine is more appropriate for the layout of biostable CCF. The biostability of oleic acid and oil, the difficult-to-replace components of synthetic and semi-synthetic CCF, can be enhanced by the addition of morpholine and 2-mercaptobenzothiazole, with which the growth of fungi is generally incompatible.

Keywords

Bacteria, Biostability, Cutting fluid, Destructors, Micromycetes, Mold fungi

References

[1] Microbial destruction cutting fluid and their components / Smirnova N.N., Inyusheva A.A. // Actual questions of engineering science: theoretical and practical aspects: collective monograph.-Ufa: Omega Science, 2017.-P. 39-57.

[2] Increase of biological purification of cutting fluid-containing sewage by stimulation of sludge with salt of phosphenic acid / Ilnar A. Nasyrov, Nina N. Smirnova, Alena A. Inyusheva // The Turkish Online Journal of Design, Art and Communication TOJDAC.-2017.-№ 7 SE.-P. 1623-1629

[3] Increases in efficiency of biological purification of the cutting fluid-containing sewage by use of selective destructors of surfactants / Ilnar A. Nasyrov, Nina N. Smirnova, Alena A. Inyusheva, Albina R. Sadykova // The Turkish Online Journal of Design, Art and Communication TOJDAC.-2017.-№ 7 SE.-P. 1615-1622

[4] Cutting fluid technological means and their application in the processing by cutting: Handbook // Khudobin LV-M.: Mechanical Engineering.-2006.-543 pp.

[5] Bacterial chitin degradation – mechanisms and ecophysiological strategies. Review / Beyer S., Bertillsson S. // Frontiers in Microbiology.-2013.-V. 4.-P. 1-12

[6] Lytic enzyme complex of an antagonistic Bacillus sp. X-b: Isolation and purification of components / Helisto P., Aktuganov G., Galimzianova N., Melentjev A., Korpela T. // J. Chrom. B Biomed Sci. Appl.-2001.-V. 758, No. 2.-P. 197-205.

[7] Bioproduction of chitooligosaccharides. Review / Jung W.-J., Park R.-D. // Mur. Drugs.-2014.-V. 12.-P. 5328-5356.

[8] Tahmassebpour, M., & Otaghvari, A. (2016). Increase Efficiency Data Processing with Using an Adaptable Routing Protocol on Cloud in Wireless Sensor Networks. Journal of Fundamental and Applied Sciences, 8(3S), pp. 2434-2442.

[9] Bioconversion of chitin-containing wastes for the production of enzymes and bioactive materials. Review / Wang S.-L., Liang T.-W., Yen Y.-H. // Carbohydr. Pol.-2011.-V. 84, No. 2.-P. 732-74

[10] Atafar, A., Shahrabi, M., Esfahani M. (2013). Evaluation of university performance using BSC and ANP. Decision Science Letters, 2(4), 305-311.